Amendments to the Specification:

Please amend the above-identified application as follows:

Applicant accepts the proposed corrections to the specification required by the Examiner and hereby revises the specification accordingly, while also making certain additional changes to the specification as noted below:

Page 2, lines 18-23:

It is ~~very~~ inconvenient to collect waste as a gas because it is difficult to transport and ~~bulky~~ voluminous to store. It is more convenient ~~if the waste can be converted~~ to convert the waste, at least partially, into a solid or liquid ~~waste~~ form. ~~It is well known to~~ The use of cold traps to completely condense some chemical vapors is well-known. It is also well known to use cold traps to condense elements of a precursor [[to]] at least to simplify the waste collection process.

Page 2 [sic, 3], line 9 (entire paragraph included herein):

The reaction occurs at a temperature higher than ~ 100°C. The efficiency of this reaction is roughly 10-20%[[,]]; thus 80-90% of the precursor leaves the process chamber un-reacted. A cold trap would then collect the precursor Cu-hfac-tmvs, and the by-products Cu(hfac)$_2$ and tmvs. Using a hot trap before the cold trap, most of the precursor would further ~~reacts~~ react, leaving only the by-products in the waste stream.

Page 3 [sic, 4], line 17 (entire paragraph included herein):

Accordingly, a high pressure chemical vapor trapping system to separate and collect elements of a chemical vapor exhaust is provided. The system comprises a hot trap and a cold trap connected to each other as a single unit. The exhaust pump is upstream of the hot and cold trapping system, providing [[a]] high pressure in the hot trap. While prior art ~~proposes positioning~~ positions the hot trap upstream of the exhaust pump to avoid damage to the pump, we found no significant damage to the exhaust pump by having the pump connected directly to the process chamber. The reason is that the pump temperature is much lower than most process temperatures, and most processes require high temperature for deposition[[,]]; thus, there is minimum deposition at the pump.~~, since the pump temperature is much lower than most process temperature~~. With use of a wet pump, the only side effect is the faster degradation of the pump oil, thus needing a more frequent oil changing schedule.

However, ~~in the case~~ the the use of [[the]] a dry pump, which ~~since it~~ uses no oil, ~~there is~~ positioning the pump upstream of the hot and cold trapping system has no effect on the pump. Since a dry pump typically runs at less than ~ 70°C ~~temperature~~, and a wet pump runs at room temperature, and since deposition processes run at much higher temperatures, e.g., ~~while the deposition process uses much high temperature,~~ typically 200°C for MOCVD copper deposition[[,]]; [[and]] 400-500°C for PECVD deposition[[,]]; and 1000-1100°C for rapid thermal deposition, the prior art concern ~~that there is~~ about significant deposition at the pump, leading to [[the]] degradation of the pump, is ~~proven by~~ not a concern using this invention ~~to be not correct~~.

Page 6, lines 11-17:

In some aspects of the invention [[the]] both the hot and the cold ~~chambers~~ traps are easily removable for efficient recycling of the collected waste materials. A first exhaust line extends to the exhaust input port of the hot trap. The first line ~~including~~ includes at least one valve to block the passage of gas from the deposition process chamber. Likewise, a second exhaust line extends from the hot trap gaseous exhaust port, and also includes at least one valve to block the excape of gas from the second line.

Page 6 [sic, 7], line 16 (note that this is a heading within the body of the specification, and the original text is underlined. The underlining is not reproduced here, as it would obscure the revision made to add the text required by the Examiner. The underlining in the original should be retained):

Detailed ~~description of the preferred embodiment~~ Description of the Preferred Embodiments

Page 6 [sic, 7], second line from the end (entire paragraph included herein):

Fig. 2 shows the present invention ~~of the~~ high pressure chemical vapor trapping system. The exhaust from the processing chamber 110 is pumped away by the vacuum pump 130. The pressure in the process chamber foreline 115 is normally low, in the range of torr or millitorr pressure. After the vacuum pump, the pressure is almost atmospheric at the vacuum pump exhaust 135. The hot trap 120 converts un-reacted precursors to the precursor by-products, and the cold trap 140 converts the gas phase by-products to non-gaseous phase by-products for ~~easily~~ easy transport and storage. The present invention connects to the downstream of the vacuum pump to take advantage of the high

pressure at the pump exhaust. By not disturbing the chamber configuration, there is no potential contamination of the process.

Please insert the following text after the paragraph above:

In particular, Fig. 2 shows a processing chamber 110 connected by a process chamber foreline 115 to a vacuum pump 130. The vacuum pump 130 can be a wet pump that uses oil, or a dry pump. As discussed above, both types of pumps operate at temperatures well-below any range of temperature that might result in damaging deposition in the pump. The vacuum pump 130 exhausts through exhaust line 135, which is connected with an input port 161 for a hot trap 120. The vacuum pump creates high pressure at the hot trap input port 161. The input port 161 of the hot trap 120 has a first valve 150 to prevent exhaust from escaping when the hot trap is disconnected for cleaning or other purposes. The hot trap 120 also has an output port 163 having a second valve 153 which is also used to prevent exhaust from escaping from the hot trap 120 when the hot trap is disconnected from the system 100 for cleaning or other purposes.

The hot trap 120 may also contain a plurality of collection surfaces 159 extending into the hot trap 120. These collection surfaces 159 can be heated by a chamber heater 157 to the temperature of the hot trap 120, generally ranging from 100°C -500°C. The chamber heater 157 is depicted generically as a coil in the drawings, but the chamber heater 157 need not be an isolated element. Without limitation and by way of example only, the chamber heater alternatively can be associated with the collection surfaces159 or it can be part of the chamber itself. The collection surfaces 159 collect deposited solid metal waste, which can be reclaimed from the collection surfaces 159 when the hot trap 120 is disconnected to be cleaned.

Moreover, in another aspect of the invention depicted in Fig. 3, the hot trap 120 can be biased with a negative voltage 127 to attract positively charged metal from, e.g., an MOCVD precursor to the collection surfaces 159. Alternatively, the hot trap 120 can be biased with a positive voltage to attract negatively charged metal from an MOCVD precursor to deposit on the collection surfaces 159. The bias is added to the hot trap in order to accelerate the deposition process and improve hot trap efficiency. In yet another aspect of the invention, the hot trap 120 can be connected with a catalyst inlet 125 to accelerate the deposition process and thereby improve the efficiency of the hot

trap 120. The other elements depicted in Fig. 3 are essentially the same as the elements in Fig. 2.

In both Figs. 2 and 3, the output port 163 of the hot trap 120 is operatively connected with the input port 165 of a cold trap 140 located downstream of the hot trap 120. The cold trap accepts chemical vapors from the hot trap via the cold trap input port 165 and cools the vapor with a cooler 175 to a temperature lower than the temperature of the hot trap 120. The cooler 175 can be either part of the cold trap chamber itself, or it can be associated with waste collection surfaces 160. The temperature in the cold trap 140 in one embodiment can be 25°C to negative 200°C. As by-products exhausted from the hot trap 120 are cooled, they deposit as solid waste on a waste collection surfaces 160 in the cold trap 140. Remaining vapor is exhausted through an output port 171 of the cold trap 140.

Similar to the hot trap 120, the cold trap 140 can be disconnected from the system 100 for cleaning solid waste without allowing vapor to escape. Disconnection of the cold trap 140 is accomplished with the input port valve 169 and output port valve 173 of the cold trap 140. Once chemical vapors are exhausted from the output port 171 of the cold trap 140, they are exhausted out of the system 100.

In an alternative embodiment 200 (Fig. 4), the vapor exhaust is forwarded through the output 271 of the cold trap 240 to a second cold trap 242, located downstream of the first cold trap 240, and which is maintained at a lower temperature than the first cold trap 240 with a cooler 277. The elements upstream of the second cold trap are essentially the same as those depicted in Figs. 2 and 3, with the exception as noted above, that the vapor exhaust is not exhausted out of the system, but rather, through the second cold trap. Elements in Fig. 4 that are similar to the elements in Fig. 3 have the same number in Fig. 4 as they do in Fig. 3, but in the 200 series of numbers. The second cold trap 242 accepts chemical vapor exhaust through an input port 279 of the second cold trap 242, which is connected with the output port of the first cold trap 240. The lower temperature of the second cold trap 242 relative to the first cold trap 240 results in further deposition of solid waste at collection plates 260 in the second cold trap 242. Remaining chemical vapor is exhausted through an output port 285 of the second cold trap 242 and out of the system 200. Similar to the first cold trap

240, the second cold trap 242 can be disconnected from the system 200, for cleaning or other purposes, without release of chemical vapors by closing input valve 281 and output valve 283.

Please omit the final paragraph of the specification, found on page 8 at lines 6-10:

~~Fig. 3 shows another aspect of the present invention of the high pressure chemical vapor trapping system. A bias voltage 127 is applied to the hot trap to accelerate the deposition process. A catalyst inlet 125 is supplied to the hot trap also to accelerate the deposition process, thus improve the efficiency of the hot trap.~~

Please add the following text to page 7, after line 14 (the brief description of Fig. 3):

Fig. 4 shows another aspect of the present invention of the high pressure chemical vapor trapping system.